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UNITED STATES DEPARTMENT OF AGRICULTURE  
CONSUMER AND MARKETING SERVICE

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**LETTUCE**

**MARKET  
INSPECTION INSTRUCTIONS**

**September 1963**

PROCUREMENT SECTION  
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U.S. DEPT. OF AGRICULTURE  
MARKET & INSPECTION SERVICE

**FOR USE OF FRESH FRUIT AND VEGETABLE INSPECTORS**

FRUIT AND VEGETABLE DIVISION  
FRESH PRODUCTS STANDARDIZATION AND INSPECTION BRANCH  
WASHINGTON, D. C.



# INSPECTION INSTRUCTIONS

## HANDBOOK CONTROL RECORD

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UNITED STATES DEPARTMENT OF AGRICULTURE  
CONSUMER AND MARKETING SERVICE  
FRUIT AND VEGETABLE DIVISION  
FRESH PRODUCTS STANDARDIZATION AND INSPECTION BRANCH

MARKET INSPECTION INSTRUCTIONS

FOR

LETTUCE 1/

INTRODUCTION

The leading states in the production of Iceberg type head lettuce (1)  
are California, Arizona, Texas, Colorado and New Jersey. Several other  
states ship lettuce in smaller quantities. Practically all commercial  
head lettuce is shipped in standardized paper cartons 9-3/4 x 14 x 21  
inches and, with the exception of lettuce going to nearby markets,  
practically all lettuce is vacuum cooled. At this time a relatively  
small volume of lettuce is marketed with heads individually wrapped in  
any of several types of clear plastic film (including the so-called  
"shrink-wraps") and packaged in special cartons. Film wrapped packaging  
is still in a somewhat experimental stage.

HANDLING AND PACKING METHODS

Practically all head lettuce is now trimmed and packaged in the (2)  
field. The lettuce is cut from the stalk with a sharp knife and the  
heads are trimmed of the excessive and most unattractive wrapper leaves.  
The lettuce then is packed in cartons, hauled to vacuum coolers and is  
moved from the coolers directly aboard cars or trucks. Inspection may  
be performed in the field with the inspector following the packers, or  
it may be performed at the vacuum cooler. Some field packed lettuce  
which is destined for nearby markets is packed in crates or various other  
containers and is not vacuum cooled.

INSPECTION METHODS

Representative sampling is essential for accurate certification (3)  
regardless of the correctness of an inspector's grade interpretations.

(1) Unrestricted Inspections and Appeals. If the entire carload is (4)  
made accessible for inspection, a minimum of ten representative cartons  
will be selected for complete examination. In making appeals, in-  
structions in paragraphs 146 and 149 of the Destination Market Handbook  
will be followed.

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1/ This supersedes Market Inspection Handbook for Lettuce dated  
December 1954, Amendment I dated October 1956 and Interim In-  
structions dated July 1961.



- ★ (5) (2) Making Restricted Condition or Grade Inspections. If the carlot is intact and it is necessary to restrict an inspection to the upper two layers of the load, at least six representative cartons shall be selected for complete examination. If considerable variation in samples is found, more cartons should be selected and examined. It is particularly important that examination be made in adequate light. Inspection of cartons inside the car away from the doors should not be attempted. If the car is partly unloaded and inspection is restricted to that portion of the load remaining in car at time of inspection, a proportionate number of representative samples must be selected. ★
- (6) The inspector should repack each carton properly and carefully after he has examined the heads it contains. Careless repacking may result in criticism of the inspector and of the Inspection Service. The heads on the bottom layer should be repacked with the butts down and those in the top layer with the butts up.
- (7) (3) Recording Solidity. Unless a system is used, it is difficult when examining a carton, to remember the number of defective heads of each type and also the solidity of each head. The procedure recommended to aid the inspector to remember the solidity of the heads in the cartons he examined is described as follows:
- (8) The solidity of the heads is carried in mind as a figure consisting of three digits. The first digit represents the hard heads, the middle digit the fairly firm, and the last digit the soft. So instead of thinking one hard, two fairly firm, three soft, etc., you need only carry in mind a three digit figure. For example, when you start to score the heads in a carton: if the first one is hard, think 100, and if the next is fairly firm, think 110; if the next is soft, think 111; if the next is fairly firm, think 121, etc., until all the heads in the carton have been examined. It is unnecessary to carry in mind the number of firm heads, as this will always be the number left that are not hard, fairly firm or soft. Remember, solidity is reported on all heads including heads scored as defects.

#### SAMPLING TO DETERMINE INTERNAL DEFECTS

- (9) Internal defects such as internal tipburn, seedstems and some other defects cannot be detected without opening the head. It is important to follow a uniform procedure in drawing samples for the determination of the percentage of such defects. Tipburn and other defects which cannot be detected by external examination of the head (without removing 2 or more head leaves) are considered "internal" defects. Although the percentages of internal and external tipburn are determined separately, they must be totaled and applied against the same tolerance.
- (10) Open a minimum of 5 heads from each sample. The heads examined for internal defects shall be selected without regard for the presence of external defects on the same head. Predetermine the location of such heads before inspection. Additional heads may be opened when necessary to accurately determine the percentage of internal defects.



The percentage of internal defects shall be based on the total number of heads opened. This percentage shall be added to the percentage of external defects in reporting the total percentage of defects and in determining the grade. When individual heads have a combination of external and internal defects score the more serious of the two defects. If internal defects are present it is necessary, of course, to open as many additional heads in any container as may be required to determine whether the container limitations are exceeded. In that case separate percentages must be computed for each container. (11)

In order to achieve uniformity in the determination of internal defects it is essential that all inspectors make a thorough examination of the interior of each head in the "internal defects" sample. Superficial examination is not enough. The most frequently recommended method is to strike the butt sharply so that the midribs separate from the stem. The leaves can then be readily spread out for examination. Fairly firm or firm heads frequently can be torn apart with the fingers although the resulting tearing of the leaves may obscure some defects. If heads are cut, they must also be broken open and spread out to expose the whole interior. (12)

A neat and complete record of each carton examined shall be kept under the appropriate headings on the note sheet. The example below illustrates the headings to be used. (13)

PLACE _____	MARKS OF PREVIOUS INSPECTION _____
DATE _____ TIME _____	CAR NO. _____

		Size Sample
		Hard
		Firm
		Fairly Firm
		Soft
		Other Grade Defects
		Wrapper Leaves Decay
		Head Leaves Decay
		External Tipburn
		Total External Defects
		Open Sample
		Internal Tipburn
		Total Heads Tipburn

SUMMARY OF TOLERANCES

(14)	<u>En Route or at Destination</u>	<u>Fancy</u>	<u>No. 1</u>	<u>No. 2</u>
	A. Total Defects	12	12	12
	1. Permanent defects (included in total "A")	8	8	8
	2. Condition defects (included in total "A")	12	12	12
	3. Serious damage (included in total "A")	6	6	12
	(a) Serious damage by perma- nent defects (included in "1" and "3")	4	4	8
	(b) Decay in wrapper leaves (included in Condition defects "2" and Serious damage "3")	6	6	12
	(c) Decay in compact portion of head (included in Condition defects "2" and Serious damage "3")	3	3	3

- (15) Attention is called to the definition of "shipping point" in footnote 2/ of the standards. In effect this means that a shipment of lettuce which meets the requirements of the U. S. No. 1 grade under the "en route or at destination" tolerances may have to be re-sorted before it will be certified as U. S. No. 1 when sold to a steamship line and loaded as ship stores. The shipping point tolerances also apply to any certification for overseas shipments of purchases by the armed forces. When shipments to Canada are inspected after leaving the producing area the destination tolerances apply.

APPLICATION OF TOLERANCES

- (16) The container tolerances in the U. S. Standards for Lettuce are based on TABLE I which specifies the maximum number of defective heads permitted for each percentage tolerance for each count. The general rule of 1-1/2 times and double the tolerance permitted for individual packages used in the grades for almost all other commodities does not apply to Lettuce.
- (17) If the defects in a lot are within the average tolerances of a grade and the defects in any individual container do not exceed the



number of heads specified in the following TABLE I for each tolerance, the lot will be certified as meeting grade.

TABLE I

Lot tolerance, percent	Maximum number of defective heads permitted in any package.			
	Total number of heads in package			
	24	18 or 20	30	Over 30
1.....	1	1	2	2
3.....	3	2	3	4
4.....	3	3	4	4
5.....	3	3	4	5
6.....	4	3	5	6
8.....	5	4	6	7
12.....	6	5	7	9

(18)

PRODUCTS INSPECTED AND DISTINGUISHING MARKS

Under this heading the following factors should be reported:

(19)

- (1) Type of lettuce.
- (2) Type of container.
- (3) Distinguishing Marks.
- (4) Quantity.

(1) Types of Lettuce. There are four broad classes into which all commercial varieties have been grouped. They are as follows:

(20)

(a) Iceberg Type Lettuce or Head Lettuce. Either of these terms should be used in certifying the crisp varieties distinguished by very firm heads of crisp texture. This type is by far the most important commercially and includes practically all of the lettuce grown in the western states. The information in this circular is presented principally with reference to Iceberg type lettuce. While there are numerous varieties and strains of this type, no attempt should be made to certify variety. The popularity of varieties with growers changes rapidly; some of the more common varieties grown at this time are Great Lakes, Nos. 659, 66, 118, etc., Imperial 44, 101, Golden State A & D, Climax, Vanguard.

(21)

- (22) (b) Big Boston type is distinguished by the soft heads and the oily feel to the touch of the inner leaves. It is grown largely in the Eastern states, although some is produced in California.
- (23) (c) Romaine Type or Cos Lettuce. This is easily distinguished from all other types by its upright habit of growth, long loaf-shaped heads and spatulate leaves. It is grown as a market garden crop near many large cities and in considerable volume in both Florida and California.
- (24) (d) Leaf Type (or non-heading) Lettuce. This type is characterized by the fact that it does not form a head. It is grown in greenhouses, hotbeds, and often in open fields in some locations. Illinois, Michigan, Missouri, and Kentucky supply the Chicago area. New York and New Jersey grow a limited volume for the New York City area.
- (25) (2) Types of Containers. Most lettuce is now shipped in fiberboard cartons that contain 18, 24 or 30 heads. A minor quantity of Iceberg type lettuce is shipped to local markets or for export in the Los Angeles crate which varies from 13 to 14 inches deep, 17-1/2 to 18 inches wide and 21-1/4 to 21-5/8 inches long. A limited quantity is shipped in a half size crate and in wire-bound crates. In the Eastern states some shipments are made in other containers such as hampers, baskets, etc. The presence and type of lining paper in the crates shall also be reported under this heading.
- (26) (3) Distinguishing Marks. Identifying brands, labels, growers or shippers names and addresses, size or count stamps or marks, state lot marks and export stencils should be reported under this heading. The state of origin should be stated in connection with the brand, if it is indicated, or it may be shown as being quoted from the bill of lading, or as an "applicant states" statement.
- (27) (4) Quantity Inspected. When a lot is not in a car or when a car is partly unloaded, the number of packages covered by the certificate should be reported either as a statement on the authority of the inspector, or as "applicant's count" or "manifested as."

#### CONDITION OF LOAD AND CONTAINERS

- (28) See Destination Market Handbook.

#### TEMPERATURE OF PRODUCT

- (29) See Destination Market Handbook. It is essential in obtaining accurate temperatures of lettuce to "precool" the thermometer before taking the official reading.



CONDITION OF PACK

The bulge of cartons is not an indication of tightness of pack. (30)  
The amount of bulge will vary with the number of wrapper leaves and the shape of the heads. Tightness of pack is to be judged by the tightness of heads in layers when the container is resting on its bottom.

The following terms should be used in describing the tightness of pack: (31)

Excessively Tight - means that the heads are so tightly packed that they are damaged by pressure causing distortion or crushing of the heads or breaking of the midribs. The term should be used only to describe a condition. (32)

Tight - means that the layers are completely and tightly filled without injury to the heads. This represents the most desirable pack. (33)

Fairly Tight - means that the layers are filled, but the pack is somewhat loosely arranged, and in cartons usually additional heads, but not a complete row, can be inserted in the container. (34)

Slack - means that the pack is very loose in layers and in standard cartons an additional row or layer can be added. The amount of slackness must be reported in inches. (35)

STANDARD PACK

For detailed requirements of Standard Pack, refer to the U. S. Standards. Note that: (36)

(a) There is a requirement that heads shall not be excessively tightly packed. (37)

(b) "Fairly uniform in size" means that not more than 10 percent of the heads in a container may "vary appreciably" in size from the standard size head for the count pack. This requirement restricts heads which are appreciably larger or smaller. If the difference in size between 2 heads side by side is readily apparent, they vary appreciably in size. (38)

(c) The example of a standard size head uses a head with 4 wrapper leaves as an illustration but it provides for considering heads with lesser or greater numbers of wrapper leaves equivalent to that size if they can be packed as specified for the standard size head. (39)

- 7a -

REPORTING GROSS OR NET WEIGHT OF CONTAINERS

Weight alone may be certified without the necessity for also making an inspection for grade or condition. Charges for this service should be made on an hourly rate basis with a 2 hour minimum rate. If the number of containers in the lot is so small that the above minimum hourly rate would be inequitable, a lesser fee may be charged, based on the hourly rate, at the discretion of the officer in charge.

Net weight usually is most desirable to the applicant and shall be reported unless gross weight is specifically requested. Gross weight shall not be reported without specific request from the applicant or it is understood that it is impractical to determine net weight such as in the case of DSSC shipments, or when the tare weight of the container is predetermined so that gross weight designation is satisfactory.

The following procedure shall be used in determining the total number of containers to be weighed in the lot:

1. Disregard lot size;
2. Select all sample containers at random;
3. Weigh each sample container to the nearest 1/4 pound.
4. Select the first 10 containers at random and determine the range in weights; and,

Example:

<u>First 10 Containers Weighed</u>	<u>Pounds</u>	
1	43.0	
2	42.5	
3	42.0	
4	45.0	} Range in first 10 containers. <u>5 pounds</u>
5	42.0	
6	40.0	
7	41.5	
8	43.0	
9	40.0	
10	40.0	

5. After the range of weights in the first 10 containers has been established, determine the total minimum number

of containers to be weighed in the lot by using the following table:

Range of first 10 containers weighed lbs.	Total number of containers to be weighed in lot
4.5 or less	10
4.6 - 6.9	20
7.0 - 9.9	30
10.0 & over	50

Weight shall be reported under the "Pack" heading. Report the range in weights, the average, and the percentage of containers which are under the weight specified or under the weight marked on the container.

Example: "Net weight per carton ranges from 37-1/2 to 49-1/2, average 43 pounds. 9% of cartons under 40 pounds net".

When inspections are made for weight, the following information shall be shown on the note sheet for future reference:

1. Type and name of scale used.
2. Graduations of the scale (1/4 lb., 1/2 lb., or pound).
3. Owner of scale (whether Government scale or applicant scale or other source).



- (40) (d) Lettuce in standard cartons shall have a net weight of not less than 40 pounds and not more than 48 pounds. In determining compliance with this requirement, cartons shall be selected at random, individually weighed, the tare deducted, and the net weight recorded. The tare weight should be the average of the weights of at least 4 cartons and any liners or wrappings. The tare weight should also be recorded on rough notes. The following table summarizes the number of cartons to be weighed in any lot and the number of cartons which may fail to meet the weight, uniformity of size and tightness requirements. When certification of Standard Pack is requested, the applicant must make a satisfactory platform type scale available to the inspector. It may be necessary for the applicant to furnish a truck and helper to get the necessary number of samples from the car for weighing.

(41) NUMBER OF CARTONS TO BE WEIGHED AND EXAMINED FOR STANDARD PACK COMPLIANCE

Number of Cartons Weighed & Examined	: Lot Passes	: Lot Fails	: Weigh and Examine : 14 Additional Car- : tons
14	:When none fail :to meet Stan- :dard Pack re- :quirements	:When 3 or more :cartons fail to :meet Standard :Pack require- :ments*	:When 1 or 2 cartons :fail to meet Stan- :dard Pack require- :ments
28 (Original 14 plus 14 additional be- cause 1 or 2 car- tons in first 14 were not in compli- ance.)	:When 1 or 2 :cartons fail to :meet Standard :Pack require- :ments	:When 3 or more :cartons fail to :meet Standard :Pack require- :ments*	:Weigh and examine :no more than total :of 28

\* Lot fails - weighing and examining may be stopped any time three cartons are found not in compliance.

- (42) (e) The weight requirement is only one of the requirements of Standard Pack. Heads must also be fairly uniform in size, and tightly but not excessively tightly packed according to approved and recognized methods. The figures in the preceding table include all cartons which, for any reason, fail to meet the Standard Pack requirement. Thus, if 14 cartons were weighed and 2 of these failed to meet the weight requirement and another of these 14 cartons was found in which the heads were not tightly packed, there would be 3 cartons which failed to meet the Standard Pack requirement. The lot would fail to meet Standard Pack.



The restriction providing for failing those lots which show 3 or more cartons out of 28 off-weight, or which otherwise do not meet Standard Pack requirements, has been statistically calculated on the basis of the 10 percent allowance provided in the Standards for containers failing to meet the Standard Pack requirements. (43)

### SIZE

The size of Iceberg type lettuce, when packed in cartons or crates, is indicated by numerical or dozen count. (44)

Heads of lettuce may be described as fairly uniform or irregular in size. The term "uniform" should not be used. (45)

Fairly uniform in size means that not more than 10% of the heads in a container may vary appreciably from the standard size head for the count pack. (46)

The standard size head for a 2 dozen pack is that size head having 4 wrapper leaves, which will pack tightly but not excessively tightly 3 rows with 4 heads of uniform size in each row in a layer in a standard fiberboard container. Heads having lesser or greater numbers of wrapper leaves, which can be packed as specified herein, are considered equivalent in size to a standard size head with 4 wrapper leaves. (47)

Irregularly sized heads are those that vary more in size in a container than permitted by the definition of fairly uniformly sized heads. (48)

Big Boston type - The terms "large," "medium," or "small" may be used in describing size of Big Boston type lettuce packed in hampers. The following are definitions of these terms: (49)

"Large" - means heads weighing a pound or more.

"Medium" - means heads weighing 1/2 to 1 pound.

"Small" - means heads weighing less than 1/2 pound.

For Romaine or the Cos type (50)

"Large" - means plants 12 to 18 inches in length.

"Medium" - means plants 8 to 12 inches in length.

"Small" - means plants less than 8 inches in length.

Big Boston type in Crates. When Big Boston type lettuce is packed in crates containing 2 dozen heads, the size should be described as "fairly uniform" or "irregular" as the case may be. (51)

- 10 -

QUALITY

(52) The principal factors under this heading are:

1. Color.
2. Overgrown.
3. Trimming.
4. Solidity.
5. Permanent Defects.

(53) (As practically no lettuce is certified on the U. S. Fancy grade, the following description of quality factors will be generally limited to the application to U. S. No. 1 and U. S. No. 2. For U. S. Fancy, refer to the definitions in the standards.)

(54) (1) Green Color of Head Leaves: The U. S. No. 1 grade requires that one-half or more of the exterior surface of the head, exclusive of the wrapper leaves, shall have a light green color. Color comparators illustrating the minimum shade of green color required on at least half of the surface have been distributed. Individual sheets of this color can be purchased by industry members from the manufacturer. The word "color" should be used in connection with the word "green."

(55) \* In judging the proportion of the surface of the head having the \*  
\* required color consider that the first head leaf, exclusive of the wrapper \*  
\* leaves is the "Cap Leaf". The cap leaf, the exposed portions of the leaves \*  
\* which lie under it, and the butt form the exterior surface of the head which \*  
\* is considered in determining the percentage of the surface that is green. \*  
\* Green color of leaves should be considered a permanent quality factor. \*

(56) (2) Overgrown: Not overgrown is a requirement of the U. S. Fancy grade but not of U. S. No. 1 or U. S. No. 2. It is designed to bar "ripe," very hard lettuce from the U. S. Fancy grade. It is difficult to lay down guides for the interpretation of this term. Lettuce should be judged on what is desirable, succulent lettuce normally readily accepted by the trade. This refers to the stage of growth and life of the lettuce rather than to the length of time it has been in the field. Lettuce may have grown slowly due to adverse weather conditions but still be young and succulent. Or other conditions may have caused it to become aged and very hard. In effect, this requirement is a tool to enable the inspector to score lettuce which he feels is past its prime for U. S. Fancy but which under the U. S. No. 1 grade must be passed. Lettuce need not be readily subject to russet spotting and other discoloration to be considered overgrown. It is merely that lettuce which is readily subject to those defects may be overgrown.



This should be considered in conjunction with other factors, such as excessive hardness, very pale or whitish outer head leaves, toughness and lack of succulence and other indications that the lettuce is past its prime. Such lettuce is more likely to deteriorate and, although it may not decay or develop discoloration, it may have a generally unattractive or "tired" appearance.

(3) Trimming: The U. S. No. 1 grade requires each head to be fairly well trimmed unless the lot is specified as closely trimmed. The definition of fairly well trimmed includes closely trimmed lettuce. In the present grade, discoloration of head leaves and wrapper leaves is described under a separate heading, and is not included in the definition of the terms describing trimming. (57)

(a) "Fairly well trimmed" means only that the butt is trimmed off closely below the point of attachment of the outer leaves and that on a head of Iceberg type lettuce, wrapper leaves do not exceed 6 in number, not more than 4 of which may be excessively large and coarse. (58)

\* "CAP LEAF" is the first head leaf. This is the outermost leaf which (59)\*  
\* fairly closely enfolds the compact portion of the head, some portion of \*  
\* which extends to the top of the crown. The tip of the leaf may be separated \*  
\* from the head provided that the separation does not extend more than 1-1/4 \*  
\* inches in height from the compact portion of the head. (See Figure I). \*  
\* All leaves, outside of the cap leaf are wrapper leaves. \*

Occasionally crops of lettuce are encountered in which some to all heads have a pointed or elongated shape. In extreme instances such heads are elongated to the extent of becoming torpedo or banana shaped. Apparently this is a varietal or strain characteristic that becomes accentuated under some growing conditions. (60)

On pointed and elongated heads the wrapper leaves and several outer head leaves grow to a point and form a whorl or rosette at the top of the head. There is no normal cap leaf on such heads. The inner leaves in the whorl that closely enfold the head for most of their length must be classed as "head leaves." Any tearing or discoloration affecting them must be considered on the basis of damage to head leaves. (61)

(b) "Closely trimmed" means that the butt is trimmed off closely below the point of attachment of the outer leaves and that, on a head of Iceberg type lettuce, wrapper leaves do not exceed 3 in number, none of which may be excessively large and coarse. (62)

The certificate should show in general terms any material proportion of the heads which are closely trimmed, as in the following example: "Fairly well trimmed, most heads being closely trimmed." (63)

(4) Solidity: None of the grades requires a definite percentage of hard, firm or fairly firm heads. The only solidity requirement is that the heads must not be soft. However, when grade is certified on the (64)

basis of U. S. No. 1 the percentage of hard heads and the percentage of firm heads in the lot must be stated in connection with the grade.

- (65) Solidity classification. The following terms shall be used in describing the solidity of lettuce:
- (66) (a) "Hard." Hard means that the head is compact and solid. This term represents the highest degree of solidity.
- (67) (b) "Firm." Firm means that the head is compact but may yield slightly to moderate pressure.
- (68) (c) "Fairly firm." Fairly firm means that although the head is not firm, it is not soft and spongy, and has good head formation and edible content.
- (69) (d) "Soft." Soft means that the head is easily compressed or spongy.
- (70) Heads that are scored as grade defects, including frozen and decayed heads, must also be scored for solidity. To illustrate: A firm head of lettuce showing Tipburn should be recorded in one column on the inspector's note sheet as a firm head and in another as a grade defect. In other words, solidity is reported on all heads regardless of whether or not they are grade defects.
- (71) The standards do not limit the range or amount of variation in solidity permitted between containers. It is only necessary to report the average.
- (72) The exact percentages of hard, firm, fairly firm and soft heads shall be reported in whole numbers. These four figures must total exactly 100%.
- (73) Hard, firm and fairly firm heads should be reported in a solidity statement. Soft heads are grade defects so they must be reported with other grade defects; however, the percentage of soft heads must also be reported separately but included with other defects, thus:
1. Defects within tolerance, including 3% soft.
  2. Defects average 10%, including 4% soft.
- (74) If soft heads show other grade defects, they should be scored as soft and if the other defects are more serious than soft heads, they should also be reported in connection with the grade defects statement, thus:



"Defects range from 5 to 20%, average 15%, including 10% soft and 2% decay. Approximately half of soft heads also show worm injury (or other defects)." (75)

U. S. No. 2 grade prohibits heads which are distinctly open and leafy with practically no head formation. While U. S. No. 2 has no other requirement as to solidity, the percentages of hard, firm, fairly firm and soft should be reported in the "Quality" statement for the benefit of users of the certificate. (76)

Bibb Lettuce - Has the same U. S. No. 1 solidity requirement as Iceberg type lettuce. Heads must not be soft. Heads shall not be scored as soft unless undesirably loose and leafy with practically no tendency to form a rosette head. Only one to two outer whorls of leaves should be treated as wrapper leaves, the balance of the plant should be treated as head leaves. (77)

Big Boston Type Lettuce - Big Boston lettuce also is required not to be soft to meet the U. S. No. 1 solidity requirement. Since this lettuce is somewhat more pliable than Iceberg type, a fairly firm head of Big Boston would not feel quite as solid as a fairly firm head of Iceberg. It would, however, have good head formation and considerable resistance to crushing. (78)

Determining Solidity. The firmness of a head of lettuce is properly determined by holding the head with its base or butt in one hand and the top of the head in the palm of the other hand with the fingers extending down the sides of the compact portion of the head under the wrapper leaves. Squeeze the head once to determine the solidity. Repeated squeezing may break down the rib structure of firm and fairly firm heads so that no accurate determination may be made. After firmness has been determined, the wrapper leaves should be forced gently back from the head taking care not to break them unnecessarily. The outer head leaves may then be examined for grade defects such as Tipburn, dirt, broken midribs, etc. (79)

(5) Permanent Defects (80)

- (a) Aphids
- (b) Broken Midribs
- (c) Burst
- (d) Dirt
- (e) Opening
- (f) Poorly trimmed
- (g) Ribby
- (h) Seedstems
- (i) Soft
- (j) Suckers
- (k) Worm damage and Insect injury other than Aphids
- (l) Mechanical damage

- (81) (a) Aphids should be scored as damage when the compact portion of the head is infested. The head is considered infested when there are more than 5 aphids on the compact portion of the head or on the head leaves. Also, when the wrapper leaves are badly infested, that is, having sufficient scattered aphids or clusters of aphids to be readily noticeable and seriously affect the appearance, the heads should be scored as damaged. The inspector should examine the heads in a good light as the aphids are a grayish green in color. Notes should indicate whether aphids were found on head leaves or wrapper leaves, or both. Aphids multiply rapidly at warm temperatures but are killed at temperatures below 32 degrees F. When there are large numbers of live or dead insects, the head should be scored as seriously damaged.
- (82) (b) Broken Midribs should be scored as damage when more than two head leaves have midribs broken in two due to abnormal growth. The definition of damage by broken midribs does not restrict scorable broken midribs to the outer head leaves. However, there is no intention that the inspector should open the heads to search for broken midribs. If two broken midribs are found in the outer head leaves, and upon casual examination there is no indication of other broken midribs, the head should be passed on this factor. On the other hand, if there are no broken midribs in the outer head leaves but during examination there are indications of broken ribs deeper in the head, the head should be opened sufficiently to determine whether more than 2 midribs are broken. To be considered, midribs must be broken due to abnormal growth. Such breaks will usually show a separation resulting from the pressure of the expanding head. The broken ends may also show reddish discoloration. Do not confuse these breaks with broken ribs resulting from excessively tight packs and mechanical causes. These often will show crushing and should in all cases be considered as mechanical damage. Broken midribs are not classed as serious damage.
- (83) (c) Burst heads are those that have broken open. They are defects of both U. S. No. 1 and U. S. No. 2 and are to be scored as serious damage. So-called "split" heads are classed as "burst."
- (84) (d) Dirt. When the head is smeared with mud, or when wrapper leaves are badly smeared with mud, or when the basal portion of the head is caked with mud or dry dirt, it shall be considered as damaged. Such heads shall be scored against U. S. No. 1. This condition is usually found following a rain, heavy fog or heavy irrigation. If reasonable care is used in harvesting, this condition may be avoided.
- (85) Although it is an unusual condition, dirt is sometimes found in sufficient quantities in the outer head leaves to score the head against the grade. Dirt may be blown between the leaves by high winds during growth when the head is not tightly formed. If there is sufficient



dirt present to materially affect the appearance or the edible quality the head is damaged.

If head or wrapper leaves are slightly dirty, even though not affecting grade, the condition should be described on the certificate. (86)

(e) Opening: Damage by opening means hard or firm heads which have one-fourth or more of the head distinctly separated from the remainder or any degree of opening in fairly firm heads. Do not score as serious damage. (87)

\* (f) Poorly Trimmed heads are those that do not meet the requirements of fairly well trimmed in the U. S. No. 1 grade. There are no requirements for trimming in the U. S. No. 2 grade. En route or at destination, when poorly trimmed heads are reported in the grade defects statement the range in number of wrapper leaves must be shown in parentheses following the words "poorly trimmed." \* (88)  
\* Example: "Grade defects average 6%, generally poorly trimmed  
\* (7 to 12 wrapper leaves)". \*

(g) Ribby: At times, on account of growing conditions, the midribs of the heads are very prominent, in some cases protruding outside of the compact portion of the head. This condition should be scored as injury against U. S. Fancy when the midribs of the head leaves are so prominent that they materially detract from the appearance of the head. Ribbiness should not be scored against the U. S. No. 1 grade as damage regardless of the degree, however, if it is so pronounced as to affect the appearance of the lot, it should be described in general terms, thus: "Many heads have ribby appearance." (89)

(h) Seedstems: Seedstems should be scored as damage when they are excessively long, excessively curved, tough or fibrous. (Refer to the illustrations of seedstems at the end of this handbook.) (90)

Often external characteristics, such as the shape of the head and spreading at the base between points of attachment of the leaf stems to the main stem, may indicate that "seeders" are developing but this indication is not reliable in all instances. When a spot check and random cutting has indicated the presence of seedstems in a lot, it will be necessary for the inspector to follow the instructions for determining the percentage of internal defects in a lot. (91)

Seedstems should be scored as serious damage when they split the heads or when they protrude through the outer head leaves. When certifying on the basis of the U. S. No. 2 grade it is unnecessary to open heads, because they would not be scored against U. S. No. 2, regardless of how much the seedstem may curl inside the head. (92)

(i) Soft heads are those that are spongy and easily compressed. They are defects of U. S. No. 1 but not of U. S. No. 2. The percentage of soft heads must always be stated in connection with the average of the permanent grade defects, thus: "Grade defects average 5% including 1% soft heads." This procedure is necessary so that the percentage of soft heads may be added to the percentage of other stages of solidity to total 100%. (93)



- (94) Bibb and Big Boston Type Lettuce must also meet the requirements of fairly firm (must not be "soft") in the U. S. No. 1 grade.
- (95) (j) Suckers: On some strains of lettuce suckers two to three inches long are occasionally encountered growing between the wrapper leaves on the compact portion of the head at its base. There may be several smaller ones inside the head between the leaves. They do not affect the edible quality or the appearance of the head and should not be scored as defects of U. S. No. 1.
- (96) (k) Worm damage and insect injury other than Aphids: Head lettuce is attacked by several kinds of insects or worms. In reporting this condition on the certificate it should be reported simply as "insect damage" or "worm damage." Heads injured by worms or other insects are practically useless unless the injury is very slight. If the outer head leaves have been penetrated, or if excreta has been deposited in noticeable amounts on head or wrapper leaves, or if more than very small portions of the head leaves have been eaten, the condition is regarded as damage. Insect or worm damage often furnishes entry for decay. When badly affected or when affecting more than two head leaves, the head is seriously damaged.
- (97) Sometimes worm or insect damage is found to occur inside the head with no visible external indication. When worms or similar types of larvae are found inside a head of lettuce, and cannot be detected without removing two or more outer head leaves, the head is seriously damaged. A head with live worm or insect other than an aphid shall be scored as a condition defect.
- (98) (l) Mechanical damage. Sometimes heads are found which have portions of the head leaves torn out by harvesters in order to remove discoloration or some other defect which they consider detracts from the appearance of the head. Frequently the resulting damage detracts from the quality of the head more than the original defect.
- (99) The whorls or rosettes of leaves at the top of heads of pointed and elongated lettuce often are torn off in the packing process or the head leaves in the rosettes are badly torn. Heads showing this type of injury should be scored as permanent grade defects as follows:
- (100) (a) Damaged when more than 2 outer head leaves are materially torn or have pieces plucked out, or the injury materially detracts from the appearance of the head;
- (101) (b) Seriously damaged when more than 3 outer head leaves are badly torn or the injury seriously detracts from the appearance of the head.

CONDITION

The principal factors under this heading are:

(102)

1. Freshness
2. Condition Defects
3. Decay
4. Diseases

(1) Freshness: "Fresh" is defined as meaning that the head as a whole has normal succulence but the wrapper leaves and the outermost head leaves may be slightly wilted. If the Iceberg head is not crisp, or if the wrapper leaves are more than slightly wilted, it should be scored as a defect against the U. S. No. 1 grade. The U. S. No. 2 grade does not require the lettuce to be fresh but specifies that it must be free from serious damage by wilting. Heads of lettuce showing decay, tipburn, freezing injury or other condition factors, but which are otherwise fresh, shall be reported as "Heads or portions of heads not affected by decay (or other defects) are fresh."

(103)

(2) Condition Defects

(104)

- (a) Bruising
- (b) Discoloration
- (c) Rib Discoloration
- (d) Downy Mildew
- (e) Freezing Damage
- (f) Pink Rib
- (g) Russet Spotting
- (h) Tipburn
- (i) Worm damage and Insect injury (live worm, aphid, or other insect present)

(a) Bruising. Bruising of lettuce in properly packed cartons is seldom a serious inspection problem. However, in cartons which are overfilled in order to meet some excessive weight specification bruising may be severe enough to justify scoring heads as damaged. Heads should be scored as damaged when more than one outer head leaf is badly bruised or more than two are materially bruised. Heads that have been so badly forced out of shape in the packing and closing process that the structure of the head has been broken down should be scored as damaged. If the inspector feels sure that such damage should have been apparent at time of shipping, such damage should not be scored as condition bruising.

(105)

(i) Reddish brown discoloration following bruising. Heads which have been bruised to the extent that they are damaged will often show a reddish brown discoloration or a watersoaked appearance in the bruised area. In describing bruising which shows reddish brown discoloration, it should be reported on the certificate as discoloration

(106)



following bruising since in most cases the discoloration will be responsible for the head being damaged. Remember, discoloration following bruising affecting the wrapper leaves should be scored on the basis of whether the appearance of the head has been seriously affected.

- (107) (b) Discoloration. There are six types of discoloration described in the U. S. Standards for Lettuce. The descriptions are on the basis of injury, damage, and serious damage. Two of the types described are general discolorations. The other four are discolorations resulting from disease or plant disorders. Any one type or any combination of two or more types should be considered when deciding whether or not a head should be scored as a grade defect. Note that no type of leaf discoloration is now considered under "trimming." Each of the six types of discoloration will be discussed in the sub-headings that follow:
- (108) (i) Discoloration of Wrapper Leaves should be scored as damage when yellow or brown discoloration from any cause seriously detracts from the appearance of a head's wrapper leaves. Consider wrapper leaves which show distinct yellow discoloration, material brown or darker areas, and material brown margins.
- (109) Any blistering on the wrapper leaves, (except that causing yellow or brown discoloration which seriously affects the appearance of the wrapper leaves) or any tearing of wrapper leaves should not be considered as seriously detracting from the appearance and should not be scored as damage.
- (110) The presence of slight brown margins, slight discoloration and slightly ragged appearance not severe enough to affect the U. S. No. 1 grade should not be scored as a defect but should be recorded on the inspector's notes and may be reported on the certificate in general terms as a description of the quality of the lot, thus: "Outer leaves show light green color but many show slight brown margins not affecting grade."
- (111) Discoloration of wrapper leaves is not classed as serious damage and is not a defect of U. S. No. 2.
- (112) (ii) Discoloration of Head Leaves should be scored as damage when yellow or brown discoloration from any cause materially detracts from the appearance of the head, exclusive of wrapper leaves.
- (113) When brown discoloration extends over more than one half of the crown of the head or when midribs of leaves are discolored, the appearance of the head is materially affected. Such discoloration is often the result of freezing or sunburn but should be reported simply

as "damage by brown discoloration of head leaves" or "discolored head leaves." If the brown discoloration is associated with blistering following freezing, it may be reported as damage by freezing injury.

Yellow or brown discoloration of head leaves that seriously detracts from the appearance of the head should be scored as serious damage and against U. S. No. 2. (114)

(iii) Discolored Butts. Oxidation frequently causes a red discoloration of the cut end of the root or butt. This does not damage the appearance of the head and it should not be scored as a defect. (115)

Occasionally lettuce shows a watersoaked, discolored condition of the central portion or core of the butt. The discoloration usually ranges from grayish to dark brown but may show a pink cast. Affected butts should be cut crosswise at a point 1/4 inch above the lowest point of attachment of the outermost leaf. If the watersoaked condition is present above this cut score the head as damage by watersoaked and discolored core. If after a second cut, 1/4 inch above the first, the condition is still present score the head as seriously damaged. (116)

(c) Rib Discoloration should be scored as damage when the aggregate length of brown or black spots of rib discoloration on the outer surface of any head leaf exceeds one inch. It is not the intent to consider only Rib Discoloration that is actually on the surface but also all discoloration which is in the interior tissue of the rib and is visible on the outer surface. (117)

Although the definition of damage does not limit the number of leaves each of which may aggregate one inch or less of Rib Discoloration, if a head had more than two leaves so affected, the appearance of the head would be damaged. Lesser amounts of rib discoloration, or lighter shades of color, are permitted on more than two head leaves as long as the appearance of the head is not affected to a greater extent than by one inch of brown or black rib discoloration on each of two head leaves. (118)

In the initial stages Rib Discoloration appears as a creamy-yellow or light brown area on the inner surface of the midrib or lateral ribs of the leaf. At this stage the discolored area is usually less than one inch in length and about a quarter inch wide. The affected tissues are firm and not sunken, pitted or slimy. Frequently at this stage a slight discoloration is found on one or a few of the outer head leaves but may also occur on the inner head leaves. It is usually found on the area of greatest curvature of the leaves but may also occur closer to the butt of the head or farther out on the leaf on the lateral ribs or large veins. (119)



- (120) In more advanced stages Rib Discoloration becomes reddish-green or blackish-brown in color. At this stage the discolored area may range from one to three inches in length and up to one-half inch in width. It is clearly visible on both surfaces of the leaf, and the affected tissues are sunken and occasionally cracked. Bacterial Soft Rot often follows advanced stages of Rib Discoloration.
- (121) Rib Discoloration is apparently a physiological disturbance which originates in the field but what factor or factors cause the condition to develop are not known at the present time. It is believed, but not proven, that Rib Discoloration may progress somewhat in transit and storage. Different lettuce varieties and strains show considerable variation in susceptibility to the development of rib breakdown. The condition develops, however, in Imperial and other types of lettuce as well as in the Great Lakes types. While it is believed by some growers that the development of Tipburn and Rib Discoloration are related, evidence indicates that there is little correlation in the occurrence and severity of these two physiological conditions.
- (122) Rib discoloration which seriously detracts from the appearance or edible quality of more than two leaves is considered serious damage.
- (123) (d) Downy Mildew shall be scored against the U. S. No. 1 grade when materially detracting from the appearance of any head leaf or when seriously detracting from the appearance of more than two wrapper leaves.
- (124) Downy Mildew can be recognized by sharply defined angular spots, yellowish to brown in color on the upper side of the leaf while the lower surfaces often show a whitish mold growth. The outer head leaves, as well as the wrapper leaves, may be affected, however the injury usually occurs first on the outer wrapper leaves. The injury will sometimes break down into decay in transit.
- (125) (e) Freezing Injury:
- (i) Transit freezing. See Destination Market Handbook.
- (126) The important items relating to damage from transit freezing are the location and distribution in the load, the quantity of stock injured, the degree of injury, condition of affected stock, and where the injury occurred.
- (127) A blistered, parchment-like appearance of the epidermis or skin of lettuce, especially along the vein, is a reliable sign of freezing injury. It does not occur unless ice was formed in the tissues. Frequently it and slight wilting are the only signs of injury in lettuce which was frozen. Lettuce so affected is likely to be tough and tasteless.



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If the freezing is severe enough to kill the tissues, they may be either dry and tough after thawing but will usually become watersoaked and are often invaded by fungi and bacteria, especially the latter, with resultant Bacterial Soft Rot. It should be borne in mind that the very presence of ice in lettuce is not a reliable sign of freezing injury. Whether or not stock showing ice will show visible injury cannot be determined until it thaws. (128)

The shiny, silvery metallic lustre noted on lettuce which is frequently attributed to "frost" is a sign of overmaturity or of scald. It occurs on the under side of the exposed leaves of the head and frequently on one side of the head. (129)

(11) Field freezing. Blistering and peeling of head lettuce caused by freezing (not including discoloration of head leaves) shall be scored as damaged at both shipping point and destination when peeling materially detracts from the appearance of more than two outer head leaves. Materially detracts means that peeling or feathering extends over more than three-fourths the area of the crown of the head. Crown means the upper half of the head. Heads of lettuce should not be "brushed" to determine damage by peeling or feathering. (130)

A scorable head must have at least three outer head leaves with peeling or feathering extending over more than three-fourths of the area of the crown of the head. (131)

Blistering and peeling that seriously detracts from the appearance of more than 2 outer head leaves will seldom be encountered. This means that lots will rarely fail to meet the U. S. No. 2 grade. (132)

Remember, discoloration resulting from freezing should be scored as damage by discoloration when materially detracting from the appearance or edible quality of more than two outer head leaves or when seriously detracting from the appearance of the wrapper leaves. (133)

(f) Pink Rib should be scored as damage when the midribs of more than two head leaves show areas of deep pink color aggregating more than two inches in length as viewed from the outer surface of the leaf, or when causing more than two head leaves to be excessively papery and tough. (134)

Two head leaves could have areas of deep pink color of any length. The areas of deep pink color should not be aggregated for purposes of scoring as a defect. Pink Rib is permitted on more than two head leaves as long as the appearance of the head is not affected by a greater extent than by areas of deep pink color two inches in length on more than two head leaves. (135)

When the above described deep pink color seriously detracts from the appearance or edible quality of more than two head leaves, it should be scored as serious damage. (136)



- (137) (g) Russet Spotting shall be scored against the U. S. No. 1 grade when present in any degree on more than 2 outer head leaves, or when the number, size, and color of the spots materially detracts from the appearance of any head leaf.
- (138) "Russet Spotting" is the name applied to a number of leaf discolorations originating in field, transit, or storage which often cannot be separated from each other with certainty. Some of these are of physiological origin such as russet, brown blight, vein browning, redheart, internal browning, brown spot, and storage breakdown. Virus diseases cause such others as Spotted Wilt, Aster Yellows (internal breakdown phase) or lettuce mosaic (necrotic phase). Another type of Russet Spotting is a form of brown spot or vein browning that may follow leaf decay, especially Bacterial Soft Rot. The term Russet Spotting is used to include all of the above types of leaf spotting but not rib discoloration, Pink Rib, Tipburn, marginal browning, or leaf spots of fungal origin such as Anthracnose or Stemphylium leaf spot. Russet Spotting often develops or spreads with extreme rapidity in transit and storage.
- (139) Russet Spotting is not only of diverse origin but its symptoms are quite variable. The spotting may consist of a few to numerous specks less than 1/16 inch in diameter and may range up to spots 1/8 inch to several inches in diameter, the average size spots being about 1/8 to 1/4 inch. The spots are usually irregular in shape. In the early stages these are light yellow in color, later they turn darker becoming pink, brown, olive-brown or blackish brown. Russet best describes the color of most of the spots. The spots may appear any place on the leaf but have a tendency to be more prevalent nearer the butts of the heads. They may be on the ribs, on the sides of the ribs, or veins, or on the leaf tissue between the veins. Russet Spotting usually first appears on the inner surface of the leaves, later both surfaces are affected. The affected tissues serve as areas for infection by secondary organisms, and often decay, mainly Bacterial Soft Rot, follows Russet Spotting.
- (140) (h) Tipburn: Tipburn shall be scored as damage when the aggregate area of tipburn of a light buff or darker color occurring anywhere in the compact portion of the head exceeds that of a rectangle one inch in length and one-half inch in width. Color comparators illustrating the minimum shade of light buff have been distributed. Individual sheets of this color may be purchased by industry members from the manufacturer.
- (141) If areas in excess of 1 x 1/2 inch are found on an outer head leaf, it will be unnecessary to examine the head further before scoring it as a defect. However, if lesser areas are found, more head leaves should be examined until the inspector finds enough additional areas to aggregate in excess of 1 x 1/2 inch or he is confident that insufficient tipburn is present in the head to justify scoring it as a defect.

Sometimes lots of lettuce are found showing tipburn affecting only the inner leaves of the head with no indication of tipburn on the outer head leaves. In such lots representative samples must be selected and opened to determine the percentage of damage by internal tipburn. Follow the procedure provided for determining the percentage of internal defects in a lot. (142)

Care should be exercised not to confuse marginal browning on the outer head leaves with tipburn as they often have a similar appearance. Tipburn on the wrapper leaves should be scored on the basis of wrapper leaf discoloration. (143)

Tipburn is a physiological disease caused by growing conditions. It starts as small spots or narrow lesions along the edge of a leaf that are bleached light yellow to off-white. Later on the affected areas usually enlarge and turn yellowish brown to brown. Areas of tipburn have irregular veined margins as compared with the clean cut margins found in connection with the marginal browning that is caused by winds or mechanical injury. When tipburn is severe or is of a moist type it may readily break down into decay. At times tipburn will develop and spread rapidly through a lot in a matter of hours or in a day or two; in other instances it appears to develop and spread quite slowly, if at all. There is no reliable explanation for this difference in its rate of development. (144)

Tipburn shall be scored as serious damage when the aggregate area of tipburn of a light buff or darker color occurring anywhere in the compact portion of the head exceeds that of a rectangle 3 inches in length and one inch in width. (145)

(1) Worm damage and insect injury. For a detailed description of worm damage and insect injury refer to paragraphs 96-97. If a live worm or other live insect other than an aphid is found in a head, it shall be scored as a condition defect. (146)

(3) Decay. See Destination Market Handbook.

\* The U. S. No. 1 grade provides a tolerance of 3 percent for decay \* (147)  
\* affecting any portion of the head exclusive of the wrapper leaves. \*  
\* Decay affecting the wrapper leaves only is scored against the 6% tol- \*  
\* erance for defects causing serious damage and not against the 3% tol- \*  
\* erance for decay. The U. S. No. 2 grade provides a tolerance of 5 per- \*  
\* cent for decay affecting any portion of the head exclusive of the \*  
\* wrapper leaves. \*

For diseases which attack lettuce and continue their activity after harvest in transit and storage, refer to Miscellaneous Publication (148)



No. 541 titled "Market Diseases of Fruits and Vegetables - Beets, Lettuce, Artichokes, Rhubarb, Sweetpotatoes."

- (149) (4) Diseases. A number of diseases or disorders cause lettuce to develop various types of discolorations affecting the head leaves. Sometimes the discoloration is found only on the midribs and veins of the leaves. At other times the discoloration appears as sunken scattered blotches and streaks any place on the leaves of the head.
- (150) Since identification of the various disorders is very difficult inspectors should describe the discolorations found. The following factors should be included in the description:
- (151) (a) whether the discoloration affects only the ribs or only the veins, or both;
- (152) (b) the predominating color, whether reddish brown, olive colored, etc.;
- (153) (c) if the affected areas are sunken, ruptured or water-soaked; and,
- (154) (d) whether discoloration affects only outer head leaves or if the inner leaves are also affected.

(155) Reporting Condition Defects

On Market Certificates averages of condition defects of 15% damage, 9% serious damage, or 5% decay affecting the head, will very often be the critical dividing line between good delivery and grounds for rejection. For this reason inspectors should examine more samples than would normally be required, to assure a high degree of accuracy when averages come out at 15 or 16% (damage), 9 or 10% (serious damage), or 5 or 6% (decay).

- (156) An unjustified "good delivery" or "rejection" situation is less likely to be set up when averages of 14 or 17%, 8 or 11% or 4 or 7%, respectively, can be established. The normal sampling rate should provide adequate probability of accuracy, unless the ranges found are extremely irregular. In such instances of irregularity additional samples should be taken.

Reporting Condition of Leaves

- (157) In order to describe clearly the condition of the leaves, the certificate must show whether the condition factor(s), (discoloration, decay, etc.) affect the wrapper leaves, head leaves or both, thus:

- 25 -

Condition: Heads or portion of heads not affected by condition factors are fresh and crisp. (158)

Wrapper leaves: (Report factors affecting the wrapper leaves.) (159)

Head leaves: (Report factors affecting head leaves or compact portion of head.) (160)

When decay and condition factors are within the grade tolerance, it will not be necessary to report wrapper and head leaves separately. (161)

#### COMPUTING THE PERCENTAGE OF QUALITY AND CONDITION DEFECTS

When reporting the percentage of quality and condition defects on the certificate, do not round the fractions computed on the rough notes up or down in such a way as to cause the combined percentage of defects on the certificate to be more or less than the unrounded total indicated on the rough notes. (162)

For example: 6.4 percent of quality defects plus 6.4 percent of condition defects should not be rounded to 6 percent of each since the rough notes will show that the total defects amount to 12.8 percent, which is reported as 13 percent and is in excess of the tolerance; 7.6 percent and 4.5 percent should not be rounded separately to 8 and 5 totaling 13, but considered as 12.1 percent combined, which is reported within tolerance. There is only one grade tolerance involved so the total amount of defects can only be correctly rounded when condition and quality defects are considered in combination. (163)

#### GRADE

Under the Grade heading on the certificate a clear statement must be made to indicate whether the lot meets or fails to meet the requirements of the grade on which it was inspected. If the lot fails to grade a percentage of grade quality may be reported. The grade statement must be based on the facts in the preceding headings on the certificate. (164)

#### Solidity in Connection with Grade.

In reporting percentages of hard and firm heads of Iceberg type lettuce at both shipping point and destination, it is satisfactory unless requested by the applicant to combine hard and firm heads in a single percentage. The percentages of hard and firm heads or the combined percentage of hard and firm heads shall be reported under both the "Quality" and the "Grade" headings. (165)

This instruction will continue in effect until the standards are amended accordingly, hard and firm heads shall be recorded separately on the note sheet, even when reporting the percentage of hard and firm heads together on the face of the certificate, so that separate percentages can be furnished in case of controversy. (165a)



Reporting Serious Defects of a Progressive Nature on Percentage Cars.

- (166) When a lot is certified on the basis of a percentage of U. S. No. 1 Quality, decay affecting the head leaves exclusive of wrapper leaves, in excess of the tolerance, must be reported in connection with the "Grade" statement, thus: "85% U. S. No. 1 Quality, 60% hard, 20% firm, 4% decay."
- (167) If the average for such decay is within the grade tolerance but the container tolerance is exceeded, the average and the fact that decay is irregular must be reported in connection with the "Grade" statement, thus: "Approximately 80% U. S. No. 1 quality, 60% hard, 20% firm, decay irregular, average 1%."
- (168) At this time decay affecting the head, exclusive of wrapper leaves, is the only condition defect that is considered a serious defect of lettuce for purposes of reporting in the grade statement.

REMARKS

- (169) Refer to Destination Market Handbook.

OTHER SALAD VEGETABLES

- (170) Chicory, Endive, and Escarole, a variety of Endive, are of importance as leaf salads. Chicory and Endive are different species of the same genus. U. S. Standards for these products should be applied and not those for lettuce.
- (171) There are two types of Chicory grown as leaf salads. One type described by some seedsmen as "Large-rooted Chicory" has broad-leaved tops of upright, spreading growth. The leaves may or may not be blanched. This type is grown chiefly in California.
- (172) The other type of Chicory, known as "Witloof," also known as "French" or "Belgian Endive" is always blanched and resembles closely trimmed Chinese cabbage. Considerable quantities of this type are imported from Europe where it is a popular winter vegetable in the larger European cities. Seedstems over 2 inches long should be scored as damage.
- (173) Endive is of two types. The first type has a deep fringed curly leaf, while the second type, commonly called Escarole, has a broad, flat leaf which is not fringed. Both types may or may not be blanched. The first type is often called Chicory by the produce trade, especially when referring to shipments originating in California. Ordinarily the commodity should be reported as Endive, unless specifically requested that Chicory appear on the certificate, in which case, the statement

should read: "Endive (Chicory)." Endive, from which large seedstems have been cut out, should be scored as damaged.

Each of these three products, although they belong to the same botanical family (Compositae), should be certified by name. If there is any doubt, refer to the illustrations in seed catalogs. They should be treated as separate commodities, and proper fees assessed. The type of container and method of packing are similar for each and all are subject to the most common diseases affecting lettuce. The same general principles should be followed in the inspection of these products as have been outlined for lettuce. (174)

#### GENERAL EXAMPLES

The following general examples cover only Size, Quality, Condition and Grade. The general instructions in the Destination Market Handbook give examples under the other headings. (175)

(1) Size: Fairly uniform.

Quality: Clean, fairly well trimmed and head leaves green color. Average 51% hard, 49% firm. Grade defects average 6%, mostly mechanical damage.

Condition: Heads or portions of heads not affected by condition factors are fresh and crisp.

Head leaves: 8 to 16 heads per carton, average 51% damage by Russet Spotting. From 2 to 5 heads per carton, average 13% decay, Bacterial Soft Rot mostly in advanced stages.

Wrapper leaves: No decay.

Grade: Meets quality requirements but fails to grade U. S. No. 1, 51% hard, 49% firm, only account condition.

(2) Size: Irregular.

Quality: Clean, fairly well trimmed, Head leaves green color. Average 72% hard, 28% firm. Grade defects range from 1 to 4 heads per carton, average 10% consisting of broken midribs.

Condition: Heads or portions of heads not decayed are fresh and crisp.

Wrapper leaves: In most cartons from 1 to 3 heads, many none, average 6% decay.



Head leaves: From 2 to 12 heads per carton, average 26% decay. Decay is Bacterial Soft Rot in all stages, mostly advanced.

Grade: Fails to grade U. S. No. 1, 72% hard, 28% firm, account grade defects.

(3) Size: Fairly uniform.

Quality: Clean, fairly well trimmed, Head leaves good green color. Average 62% hard, 25% firm, 12% fairly firm. Grade defects range from 1 to 5 heads per carton, average 12%, including 1% soft, remainder mechanical damage and broken midribs.

Condition: Heads or portions of heads not affected by condition factors are fresh and crisp.

Wrapper leaves: No decay.

Head leaves: Average 1% worm damage (live worms present). Average 1% damage by Tipburn. In most cartons from 1 to 3 heads, in many none, average 4% damage by rib discoloration. Decay ranges from 1 to 4 heads per carton, average 11% Bacterial Soft Rot, mostly in early, many in advanced stages, affecting 2 to 6 head leaves.

Grade: Fails to grade U. S. No. 1, 62% hard, 25% firm, account grade defects.

(4) Size: Fairly uniform.

Quality: Clean, generally fairly well trimmed. Head leaves good green color. Average 48% hard, 50% firm, 2% fairly firm. Grade defects average 3% damage by broken midribs.

Condition: Heads or portions of heads not affected by condition defects are fresh and crisp.

Wrapper leaves: From 2 to 4 heads per carton, average 14% damaged by Downy Mildew.

Head leaves: From 3 to 4 heads per carton, average 14% damaged by reddish brown discoloration associated with bruising. From 1 to 3 decayed heads per carton, average 8% Bacterial Soft Rot, mostly early stages.

Grade: Meets quality requirements but fails to grade U. S. No. 1, 48% hard, 50% firm, only account of condition, now average

approximately 65% U. S. No. 1 quality 48% hard, 50% firm, 8% decay.

(5) Size: Fairly uniform.

Quality: Fairly clean and fairly well trimmed. Head leaves good green color. Average 39% hard, 50% firm and 8% fairly firm. Grade defects average 6%, including 2% soft, remainder mechanical damage.

Condition: Heads or portions of heads not affected by condition defects are fresh and crisp.

Wrapper leaves: Average 2% damage by light brown to brown discoloration affecting 3 to 5 leaves. Less than 1% decay affecting wrapper leaves.

Head leaves: From 1 to 4 heads per carton, average 11% damage by blistering and peeling of the epidermis, affecting 3 to 6 outer head leaves. In most cartons 1 to 3 heads per carton, some none, average 4% damage by brown discoloration affecting 3 to 4 outer head leaves. Decay ranges from 2 to 5 heads per carton, average 10% Bacterial Soft Rot mostly in advanced stages.

Grade: Meets quality requirements but fails to grade U. S. No. 1, 39% hard, 50% firm, only account condition.

(6) Size: Irregular.

Quality: Clean, mostly fairly well, some closely trimmed, good green color, average 19% hard, 50% firm, 29% fairly firm. Grade defects range from 1 to 4 heads per carton, average 13%, including 2% soft, remainder mechanical damage and burst heads.

Condition: Heads or portions of heads not affected by condition factors are fresh and crisp. In all cartons between doors and along sidewall one side of car, and in many cartons in top layer, all heads adjacent sides and/or ends of cartons are frozen from 1/2 inch into head to entire head and are so located as to indicate freezing occurred in present location.

Wrapper leaves: 1 to 5 heads per carton, average 13% damage by yellowish brown to brown discoloration. Less than 1% decay.

Head leaves: 2 to 12 heads per carton, average 24% damage by blistering and peeling. No decay.



Grade: Fails to grade U. S. No. 1, 19% hard, 50% firm, account of grade defects.

- (7) Condition: Heads or portion of heads not affected by decay or other condition factors are fresh.

Wrapper leaves: Range 2 to 6 heads per carton averaging 14% damage by yellowish brown discoloration affecting 3 to 5 leaves. 1 to 2 decayed heads in most cartons, no decay in many, averaging 3% Bacterial Soft Rot, initial stages.

Head leaves: Range 3 to 7 heads per carton, averaging 16% damage by blistering and peeling affecting 3 to 4 leaves. Range 2 to 6 heads per carton, averaging 12% damage by yellowish brown discoloration affecting 3 to 5 leaves. 1 to 2 heads per carton averaging 6% damage by reddish discoloration following bruising scattered thru pack. 1 to 3 heads per carton averaging 8% damage including 4% serious damage by tip-burn, internal. Range 2 to 4 decayed heads per carton averaging 10% Bacterial Soft Rot, all stages affecting 2 to 3 leaves to 1/2 of head.

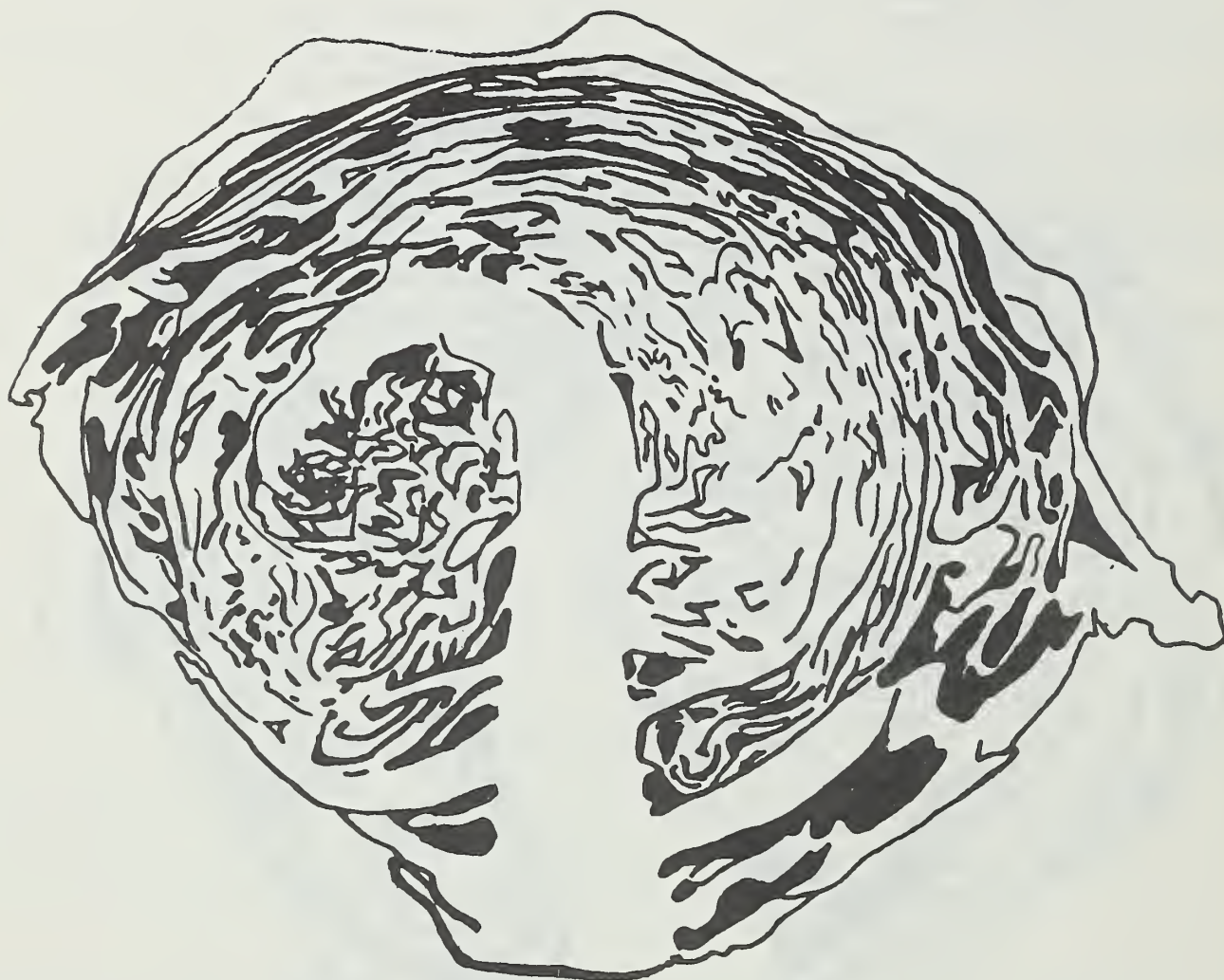
\* \* \* \* \*



LETTUCE SEEDSTEM I

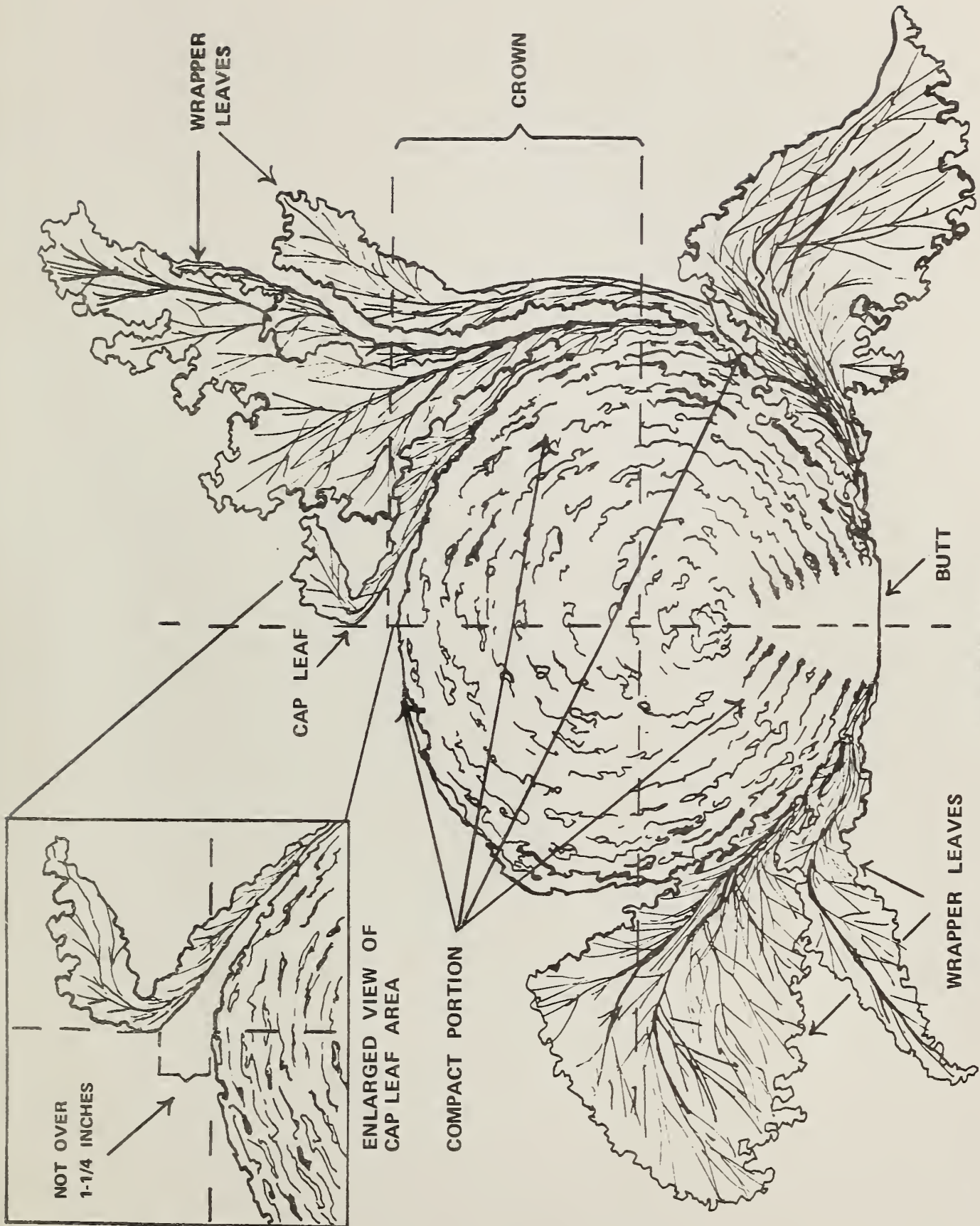
Maximum Extent To Which Head May Be Affected By Seedstem In U. S. No. 1 And U. S. Fancy Grades. (Also See Illustration Lettuce Seedstem II).





LETTUCE SEEDSTEM II

Maximum Extent To Which Head May Be Affected By Seedstem In  
U. S. No. 1 And U. S. Fancy Grades. (Also See Illustration  
Lettuce Seedstem I).



# LETTUCE (ICEBERG TYPE)

FIGURE 1.









